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EXAMINER	
BODDIE, WILLIAM	
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2629	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/691,312	LEE ET AL.	
	Examiner	**Art Unit**	
	WILLIAM L. BODDIE	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19 and 24-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19 and 24-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, March 1st, 2010 the Applicants amended claim 19 and cancelled claims 23. Currently claim 19 is pending.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 19th, 2010 has been entered.

Response to Arguments

3. Applicant's arguments filed July 19th, 2010 have been fully considered but they are not persuasive.

4. Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a *general* allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

5. On page 8 of the Remarks, the Applicants cite a large section of claim 19 and merely state that the limitations are not taught by the cited references.

Absent a more detailed description of what the Applicants believe the failings in the cited art are, the Examiner is left to merely discuss the newly added limitation concerning the lookup table.

As shown in the updated rejection below, the lookup table of Yui is seen as disclosing storing gray scale values of blue, red and green colors.

6. As such the rejection for claim 19 is maintained and the newly added claims are addressed below.

Claim Objections

7. Claims 24 and 28 are objected to because of the following informalities: grammatical errors.

Specifically claim 24 on the fourth line from the bottom of the claim reads, “outputs a image information.” This is incorrect grammatically and could possible by corrected by either removing the article “a” or replacing it with “an.”

Claim 28 on line 4 reads "LCD device begin to reduce." This is incorrect grammar and should be replaced with "LCD device begin[s] to reduce.”

Also lines 11 and 16 of claim 28 read, “a input video.” This is incorrect grammatically and could be fixed by instead reading "input video" or "an input video." Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of D'Souza et al. (US 7,046,255) and further in view of McKinnon et al. (US 6,227,668).

With respect to claim 19, Yui discloses, a method of driving a display device (6 in fig. 1), comprising:

detecting a reference gray scale level of a B color to begin reducing a color reproducibility in the display device (note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67);

storing a gray scale value of a gray scale level of the B color being present right before the reference gray scale level in a lookup table from the reference gray scale level to a maximum gray scale level (note the graphs in figs. 6A-C; and 9 in fig. 4), wherein the lookup table stores gray scale values of blue, red, and green colors (between 3 and 9 the gray scale values for blue, red and green are clearly stored in a lookup table);

receiving image information (1 in fig. 4) including a gray scale value corresponding to a red, green, blue color (RGB input, 1 in fig. 1) by the display device (input data in fig. 6);

determining whether the gray scale level of the B color is greater than the reference gray scale level to begin reducing the color reproducibility in the display device (col. 2, lines 43-45; also note the color space comparisons made by the controller in col. 4, lines 39-67);

applying the received image information to the display device upon a determination the gray scale level of the B color is not greater than the reference gray scale level (col. 4, line 59 - col. 5, line 11); and

compensating the received image information by analyzing a gray scale level of the B color in the received image information (clear from figs. 6a-c2 that the B color level has been analyzed and compensated), and replacing a gray scale value of the gray scale level of the B color gray scale value in the received image information with a gray scale value of a gray scale being present right before the reference gray scale level (clipping is performed as shown in figs. 6a1-c2) retrieved from a lookup table in response to a determination that the gray scale level of the B color in the received image information is greater than the reference gray scale level (col. 4, line 57 – col. 5, line 11, details the operation when color reproducibility is a concern);

outputting a received image information including a compensated gray scale value of the gray scale level of the B color (fig. 7); and

applying the compensated image information to a display device (6 in fig. 1).

Yui does not expressly disclose that the display is an LCD display nor that the compensation includes mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses a LCD display (col. 4, lines 60-63) driving method compensating image information (input R,G,B in fig. 2) and that retrieval of a R and G color value (506 values in fig. 5; specifically note the clipped B values and corresponding R and G values) are in response to the determination that the B color value of the displayable color is greater than the reference gray scale level (506 in fig. 5;

fig. 2; note that the data for each color is supplied to all of the filters and lookup tables. Figure 5 demonstrates that all the colors are compensated based on each other's color reproducibility); wherein the compensating includes mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.); and

applying compensated image information to a plurality of data lines of the LCD device (output of 114 to 124 is the application of the compensated image information to the data lines of the disclosed LCD; col. 4, lines 60-63).

D’Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use the image processing of Yui in an LCD taught by D’Souza.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D’Souza; col. 2, lines 4-15).

Neither D’Souza nor Yui expressly disclose how the detection is carried out.

McKinnon discloses, measuring color reproducibility of a display by measuring the B color displayed on the display panel while the gray scale level of the B color is increased (col. 3, lines 20-27; specifically note step (ii)).

McKinnon, D’Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to perform the detecting step in the display of D'Souza and Yui as taught by McKinnon.

The motivation for doing so would have been to precisely determine the threshold level (McKinnon; col. 3, lines 26-27).

10. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786).

With respect to claim 24, Yui discloses, a display device (6 in fig. 1), comprising:

a display panel (6 in fig. 4),

a lookup table (9 in fig. 4) to store a gray scale value (output data in figs. 6a2-c2; col. 3, lines 58-65) corresponding to a predetermined grayscale level (input data in figs. 6a2-6c2; col. 3, lines 33-58) of a B color (fig. 6C1-2); wherein the predetermined gray scale level is a gray scale level immediately prior to a reference gray scale level to begin reducing a color reproducibility (;col. 4, lines 26-33; also note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67), and the stored gray scale value is the maximum gray scale value corresponding to the maximum gray scale level displayable by the display panel for which the color reproducibility of the B color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel), wherein the lookup table stores gray scale values of blue, red, and green colors (between 3 and 9

the gray scale values for blue, red and green are clearly stored in a lookup table). and the lookup tables stores gray scale values each corresponding to one of 64 gray scale levels of the blue color (fig. 6 shows that the lookup tables store gray scale values from 0 to 255 which includes 1 to 64);

a data processing unit (3 and 7 in fig. 4) that analyzes a gray scale level of the B color in received image information (this information is compared with the host color space input data; col. 4, lines 26-33), replaces a gray scale value of the gray scale level of the B color in received image information with the stored gray scale value corresponding to the predetermined gray scale level of the B color retrieved from the lookup table in response to a determination that the gray scale level of the B color in the received image information is greater than the reference gray scale level color (figs. 5a-c disclose the different determinations; col. 4, lines 39-67 disclose the compensation for each determination; also note col. 4, line 57 – col. 5, line 11), and outputs image information including a compensated gray scale value of the gray scale level of the B color (fig. 7; output of 5 in fig. 4); and

a data driving unit (5 in fig. 1) to receive the image information including the gray scale value of the B color and to apply the compensated image information to the display panel (col. 2, lines 45-48).

Yui does not expressly disclose, that the display panel is a LCD panel with the requisite control circuitry or the use of 64 gray scale levels.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines

(note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48);

a gate driving unit to apply scan signals to the plurality of gate lines (5 in fig. 1); and

a data driving unit to apply image information to the data line (3 in fig. 1); and

a lookup table that stores gray scale values each corresponding to one of 64 gray scale levels of a blue color (col. 4, lines 38-44; and col. 1, lines 52-56).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption, decreased cost and fast response (Kimura; col. 1, lines 16-20).

With respect to claim 25, Yui and Kimura disclose, the device of claim 24 (see above).

While Yui discloses a 256 level gray scale instead of a 64 level gray scale, as shown above it would have been obvious to use a 64 level gray scale.

It is clear from figures 6A-2-6C-2 of Yui that once the input gray scale levels reach a certain level (based on the reproducibility of the device), that level is maintained until the maximum gray scale level.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 51^{st} gray scale level. If the color reproducibility required

that the gray scale be clipped at the 51st level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 51st level in the current invention, there does not appear to be any reason for specifically selecting the 51st level versus the 50th or 49th levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claim 25.

With respect to claim 26, Yui and Kimura disclose, the device of claim 25 (see above).

Yui further discloses, stored gray scale values corresponding to levels deemed beyond the color reproducibility of the display are identical to a gray scale value corresponding to the maximum gray scale level reproducible by the display (col. 5, liens 1-5; figs. 6c1-2).

As discussed in the above rejection of claim 25, while Yui operates in a 256 gray scale, the principle of storing identical gray scale values is taught in Yui. Upon replacing the 256 scale of Yui with the 64 scale of Kimura the levels at which color reproducibility are limited will vary from display to display. A 51st grayscale level is seen as being one such level.

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786) and further in view of D'Souza et al. (US 7,046,255).

With respect to claim 27, Yui and Kimura disclose, the device of claim 26 (see above).

Yui, when combined with Kimura, further discloses, storing gray scale values of the 52nd to the 64th gray scale (col. 5, lines 1-5) level in the lookup table (3,9 in fig. 1).

Neither Yui nor Kimura expressly disclose, mixing gray scale values of at least two of R, G, and B colors.

D'Souza discloses, mixing gray scale values of two colors (508 in fig. 5; specifically note the formerly solid blue (in 502) that now contains grayscale values for red in addition to the blue values, for certain blue colors.).

At the time of the invention it would have been obvious to one of ordinary skill in the art to mix gray scale values of at least two colors, as taught by D'Souza in the clipped gray scale device of Yui and Kimura.

D'Souza, Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

The motivation for doing so would have been, to more accurately display colors, in a more cost effective way than using sRGB monitors (D'Souza; col. 2, lines 4-15).

12. Claims 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yui (US 5,677,741) in view of Kimura et al. (US 6,008,786) and further in view of McKinnon et al. (US 6,227,668).

With respect to claim 28, Yui discloses, a method for improving a color reproducibility of a display device (6 in fig. 1), comprising:

detecting a reference gray scale level of a B color at which a color reproducibility in the display device begin to reduce(note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67);

storing a gray scale value corresponding to a predetermined gray scale level of the B color in a lookup table (3, 9 in fig. 1), wherein the predetermined gray scale level is a gray scale level immediately prior to a reference gray scale level (;col. 4, lines 26-33; also note 21 in fig. 4; the display color space in figs. 5a-c; controller 7 determines the level at which color reproducibility is reduced col. 4, lines 26-37, 57-67), and the stored gray scale value is the maximum gray scale value corresponding to the maximum gray scale level displayable by the display panel for which the color reproducibility of the B color is not reduced (clear from figs. 6a-c that the stored gray scale value (output data) is the maximum gray scale value accurately displayable by the display panel),

compensating input video data (1 in fig. 1) by analyzing a gray scale level of the B color in the input video data (col. 2, lines 43-45, for example), replacing a gray scale value of the gray scale level of the B color in the input video data with the stored gray scale value corresponding to the predetermined gray scale level of the B color retrieved from the lookup table in response to a determination that the gray scale level of the B color in the input video data is greater than the reference gray scale level (clear from figs. 1 and 6c1; also note col. 4, line 58 – col. 5, line 12), and outputting input video data

including a compensated gray scale value of the gray scale level of the B color (clear from fig. 1); and

applying the image information including the compensated gray scale value of the B color to the display device (clear from fig. 1).

Yui does not expressly disclose, that the display panel is a LCD panel or increasing a gray scale value of a B color of the LCD device.

Kimura discloses, a liquid crystal display (LCD) panel (1 in fig. 1), the LCD panel including a plurality of gate lines (note lines off of 5 in fig. 1) and a plurality of data lines (note lines off of 3 in fig. 1) crossing the plurality of gate lines, and a plurality of red (R), green (G), and blue (B) pixels arranged in a matrix pattern (col. 1, lines 47-48).

Kimura and Yui are analogous art because they are both from the same field of endeavor namely gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the display panel of Yui with the LCD panel taught by Kimura.

The motivation for doing so would have been, low power consumption, decreased cost and fast response (Kimura; col. 1, lines 16-20).

Neither Kimura nor Yui expressly disclose how the detection is carried out.

McKinnon discloses, measuring color reproducibility of a display by measuring the B color displayed on the display panel while the gray scale level of the B color is increased (col. 3, lines 20-27; specifically note step (ii)).

McKinnon, D'Souza and Yui are analogous because they are from the same field of endeavor namely, gray scale optimization within display panels.

At the time of the invention it would have been obvious to one of ordinary skill in the art to perform the detecting step in the display of Kimura and Yui as taught by McKinnon.

The motivation for doing so would have been to precisely determine the threshold level (McKinnon; col. 3, lines 26-27).

With respect to claim 29, Yui, McKinnon and Kimura disclose the method of claim 28 (see above).

Yui teaches adjusting the maximum gray scale value to corresponds with whatever level color reproducibility reduction occurs. Yui discloses at least 256 gray scale levels in fig. 6C1. Therefore Yui is seen as disclosing a determination that color reproducibility can occur at any level between 1 and 256 which necessarily includes a 51st level.

With respect to claim 30, Yui, McKinnon and Kimura disclose the method of claim 28 (see above).

Yui does not expressly disclose wherein there are 64 gray scale levels of blue color displayable by the display device.

Kimura discloses a 64 gray scale level display (col. 1, lines 52-56).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the 256 levels of Yui with the 64 levels taught by Kimura.

The motivation for doing so would have been the well-known benefit of decreased cost.

With the conversion of Yui to a 64 level gray scale the clipped portion in figure 6 would likely begin close to a 51^{st} gray scale level. If the color reproducibility required that the gray scale be clipped at the 51^{st} level then the disclosure of Yui could clearly accommodate that.

Furthermore, lacking a definite advantage of freezing grayscale values at the 51^{st} level in the current invention, there does not appear to be any reason for specifically selecting the 51^{st} level versus the 50^{th} or 49^{th} levels. This selection appears to be entirely predicated on at what level the color reproducibility begins to decrease. As Yui discloses adjusting the clipping of the gray scale based on the color reproducibility of the device, Yui is seen as sufficiently anticipating this limitation of claim 25.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM L. BODDIE whose telephone number is (571)272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William L Boddie/
Examiner, Art Unit 2629
7/23/2010